GENETICS.—*Tradition and conceptive selection.* John A. O'Keefe, Washington, D.C.

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From a biological standpoint, the loss of life from birth through the reproductive years is very small, at least in Western civilization. In the United States, out of 100 live births, 75 will live to age 45. It follows that the processes of natural selection and the survival of the fittest have very little to work with from birth to death. The survival of an infant to maturity is practically guaranteed regardless of his bodily constitution or his physical or mental strength. Consequently there is little biological advantage in these qualities, and little reason to expect the human race to advance in these directions.

The forces of selection are, however, still vigorously at work in the prenatal period, especially at conception. The annual loss of life due to contraceptives in the United States can perhaps be estimated by comparing the present birth rate of 25 per thousand with the birth rate of 35 per thousand which existed in England in the middle of the nineteenth century (there are no contemporary United States figures, but from the population changes between censuses it was at least as large). The difference of 10 per thousand per year represents 1,700,000 lives per year. This figure is almost as great as the total of all causes of death combined; and it is about four times as great as the total annual loss of life from birth to age 45. It is thus more than 10 times as efficient as a source of selection than any cause of death whatever.

We might call this selection conceptive selection and contrast it with natural selection (by death) and with sexual selection, which is the process by which some creatures gain a biological advantage over others through greater efficiency in obtaining a mate. If we regard the germ cells as individuals, it is, of course, a form of natural selection.

Conceptive selection favors, obviously, any variation, biochemical or physical, of the human reproductive cells which would permit them to escape the various traps and poisons which are provided for them. It is imaginable that over the course of the past 50 years there has been some tendency for resistant strains to appear, not easily slaughtered by the more usual agents, just as we have witnessed the appearance of penicillin-resistant strains of bacteria, or DDT-resistant flies. It would appear, however, to be a losing game; the microscopic spermatozoon is pitted against the great modern chemical laboratories.

Conceptive selection may work in another way, however, offering more prospects of long-term success. This is through the parents. If there should turn up any inheritable character which would predispose parents to refuse to employ any contraceptive means whatever, then evidently this character would be strongly favored by conceptive selection. It used to be suggested that sheer stupidity was such a factor; and that in consequence the human race was threatened with engulfment by legions of the feeble-minded. Of late, some doubt has arisen whether all or most feeble-mindedness is inherited in the strict biological sense. Cretinism, for example, was widely regarded as hereditary, until about 1900, when it was found to be an iodine-deficiency disease. Probably there are few hereditary mental traits which influence conceptive selection.

On the other hand, there is another sense in which we receive mental traits from our parents which may very well influence conceptive selection, namely, the transmittal of cultural patterns. The most obvious example is language; most of us speak the language of our parents not because of biological heredity but because of family training. However, it is almost as certain that the child of English-speaking parents will speak English as it is that the child of blue-eyed parents will be blue-eyed. Let us give the name of tradition to this method of passing on characteristics. It is nearly the same as the thing defined as tradition in Russell Kirk's book *Prospects for Conservatives.*

The power of tradition to pass on a pre-

cise pattern is not so great as the power of heredity. The modern Hindu religion retains Vedic hymns written 3,500 years ago, including the Sanskrit language of that time, with its elaborate system of nouns with eight cases and three numbers, and verbs with three numbers, five moods, two voices, and ten tenses. This is remarkable, but not so remarkable as the preservation of the genetic pattern of the horseshoe crab since the Paleozoic. Nevertheless the stability of tradition is sufficient to make it a strong factor in the survival of a human strain over a period of several thousand years.

The effect of conceptive selection in each generation is surprisingly strong. Analysis of the 1950 census figures shows that it is not a bad representation of the data to say that one-fourth of all couples have no children; one-fourth have 1 child; one-fourth have 2 children; and one-fourth have 3 or more, averaging, say, 5. Then from 8 couples we have 8 children, but the distribution of the 8 children over the families is entirely different from the distribution of the parents. U. S. Children's Bureau statistics as of 1940 showed that half of the children are supported by less than one-sixth of the families.

It is very well known that large families tend to differ systematically from small families. They tend to be more rural, more religious, poorer, less educated than the small families. In Louisiana, they are more often French-speaking than the average.

All these differences represent influences tending to preserve the traditional attitudes. This fact undoubtedly is at least partially the cause of the differences in family size; but that is not the point here. The point here is that differences in family size tend to reinforce the traditional attitudes; they tend to make the population more religious, more rural, and less educated. They also tend, obviously, to raise the size of families, so that the low average size of families is only maintained by recruitment from large families, just as cities are maintained by recruitment from the countryside.

It is possible that in our time we are witnessing the emergence of family strains with traditions which are resistant to contraception. In view of what has just been said about conceptive selection, it would be logical to expect this. In addition, there are several lines of positive evidence.

First, there is the unexplained rise of the American birth rate, beginning during the Depression and continuing through the war and postwar years. This was originally attributed to economic causes, then to the war; but now it is seen that there is some deeper cause. There has been a similar, but smaller rise in European birth rates. The increase in fertility in both continents has, however, been even larger than the increase in the birth rate; at the lowest point of the birth rate, during the Depression, it was often pointed out that the rate was being kept up by the fact that there was a surplus of persons of reproductive age left over from a period of higher birth rate. Hence a mere constancy of the birth rate would have meant a rising fertility; a rising birth rate has meant a very considerable change. This points to a shift in the average attitude toward large families. The shift is not due to any propaganda effort; in fact the organs of opinion sometimes seem to be deliberately trying to stem the tide.

Second, there is the strengthening of organized religion, both Catholic and Protestant, manifesting itself both in increased church membership and increased church-building. For the first time in United States history, the majority of citizens belong to some church. This is one of the most often remarked phenomena of our time; and it is well known that it is not due to any particular evangelism.

These signs point to a revival of traditional feeling. It is hard to associate any of them with any new intellectual developments which were not present, say, in the 1920's. There is a strong suggestion that each is due to the influence of conceptive selection. The human race seems to be moving, in a pseudo-evolution, toward a set of traditions capable of protecting the species against the ingenious inventions of individuals.